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(54) **Title:** METHOD FOR THE EXPONENTIATION OR SCALAR MULTIPLICATION OF ELEMENTS

(57) **Abstract:** In orderr to further develop a method for the multi-exponentiation $(\Pi_{i=1}^{d} g_i^{ei})$ or the multi-scalar multiplication $(\Sigma_{i=1}^{d} e_i g_i)$ of elements (g_i) by means of in each case at least one exponent or scalar (e_i), in particular an integer exponent or scalar, which has in each case a maximum bit rate (n) or bit length, in particular for the exponentiation (g^e) or scalar multiplication $(e'g)$ of an element (g) by means of at least one exponent or scalar (e), in particular an integer exponent or scalar, which has in each case a maximum bit rate (n) or bit length, which elements $(g_i; g)$ derive from at least one group (G), for example an Abelian group, which - in the case of (multi-)exponentiation is notated in particular multiplicatively and - in the case of (multi-)scalar multiplication is notated in particular additively, in such a way that the requirement in terms of storage space for recoded exponents or scalars (e_i) is reduced as much as possible even and especially in extremely restricted environments, such as in smart cards for example, the following method steps are proposed: [a.1] computing and storing or [a.2] retrieving from at least one memory all powers (g_i^c) or all multiples $(c'g_i)$, wherein c is a permissible positive coefficient; [b] dividing each exponent or scalar (e_i) into a number of chunks or into a number of parts $(e_{i,k})$ having a chunk or part width defined by a specific bit rate (L); and [c] individually recoding the chunks or parts $(e_{i,k})$.